LISTING OF THE CLAIMS

1. (Original) A flip chip light emitting diode die including:

a light-transmissive substrate;

a plurality of semiconductor layers disposed on the light-transmissive substrate, the semiconductor layers including a p-type layer and an n-type layer, the semiconductor layers defining a device mesa; and

a reflective electrode disposed on the device mesa to energize the device mesa to produce light and to reflect the light produced by the device mesa toward at least one of the light-transmissive substrate and sides of the device mesa, the reflective electrode including electrical connecting material disposed over at least selected portions of the device mesa and making electrical contact with the device mesa, the reflective electrode having laterally periodic reflectivity modulations.

2. (Original) The flip chip light emitting diode die as set forth in claim **1**, wherein the periodic reflectivity modulations define a diffraction grating that provides a predetermined diffraction of the light produced by the device mesa.

3. (Original) The flip chip light emitting diode die as set forth in claim **1**, wherein the reflective electrode further includes:

a light-transmissive dielectric layer laterally interspersed with the electrical connecting material.

4. (Original) The flip chip light emitting diode die as set forth in claim **3**, wherein the electrical connecting material defines isolated regions, and the reflective electrode further includes:

an electrically conductive reflective layer disposed over the dielectric layer and the electrical connecting material, the reflective layer laterally electrical interconnecting the isolated regions of the electrical connecting material.

5. (Original) The flip chip light emitting diode die as set forth in claim **4**, wherein the reflective electrode further includes:

a electrically conductive bondable layer disposed on the electrically conductive reflective layer.

6. (Original) The flip chip light emitting diode die as set forth in claim **4**, wherein the reflective electrode further includes:

a current-spreading layer disposed between the device mesa and the dielectric layer.

7. (Original) The flip chip light emitting diode die as set forth in claim **6**, wherein the current-spreading layer includes:

a light-transmissive electrically conductive layer.

8. (Original) The flip chip light emitting diode die as set forth in claim **7**, wherein the light-transmissive electrically conductive layer includes:

a thin film of a light-absorbing material, the thin film having a thickness of less than about 10 nm and greater than 70% light transmission.

9. (Original) The flip chip light emitting diode die as set forth in claim **8**, wherein the light-absorbing material is selected from a group consisting of nickel oxide, gold, indium tin oxide, and zinc oxide.

10. (Original) The flip chip light emitting diode die as set forth in claim **7**, wherein the current-spreading layer includes:

a topmost one or more of the plurality of semiconductor layers.

11. (Original) The flip chip light emitting diode die as set forth in claim **4**, wherein the dielectric layer has a thickness selected to define an interference reflector optimized for a characteristic wavelength of the light produced by the device mesa.

12. (Original) The flip chip light emitting diode die as set forth in claim **3**, wherein the interspersing of the electrical connecting material and the dielectric layer define a reflection diffraction grating optimized for a characteristic wavelength of the light produced by the device mesa.

13. (Original) The flip chip light emitting diode die as set forth in claim **3**, wherein the dielectric layer is selected from a group consisting of a silicon oxide (SiO_x), a silicon nitride (SiN_x), and a silicon oxynitride (SiO_xN_y), where x and y correspond to stoichiometric parameters.

14. (Original) The flip chip light emitting diode die as set forth in claim **3**, wherein the dielectric layer includes:

a topmost one or more of the plurality of semiconductor layers, the topmost one or more of the plurality of semiconductor layers including first portions having a first refractive index, and the topmost one or more of the plurality of semiconductor layers further including second semiconducting portions laterally interspersed amongst the first portions and having a second refractive index different from the first refractive index, the first portions and the second semiconducting portions cooperatively defining the topmost one or more of the plurality of semiconductor layers.

15. (Original) The flip chip light emitting diode die as set forth in claim **14**, wherein the first insulating portions of the topmost one or more of the plurality of semiconductor layers include:

ion-implanted lateral regions formed of the same material as the second semiconducting portions, wherein the ion-implanted lateral regions are substantially less electrically conductive than the second semiconducting portions.

16. (Original) The flip chip light emitting diode die as set forth in claim **1**, wherein an interface disposed between the plurality of semiconductor layers and the reflective electrode is roughened to scatter the reflected light toward the sides of the device mesa.

17. (Original) The flip chip light emitting diode die as set forth in claim **16**, wherein roughening includes a lateral periodicity defining a diffraction grating.

18. (Original) The flip chip light emitting diode die as set forth in claim **16**, wherein the reflective electrode further includes:

an insulating grid having openings at which the electrical connecting material is disposed; and

a reflective layer disposed over the insulating grid and the electrical connecting material and electrically interconnecting the electrical connecting material at the openings;

wherein the roughened interface is an interface between the reflective layer and the insulating grid.

19. (Original) A flip chip light emitting diode die including:

a light-transmissive substrate;

a plurality of semiconductor layers disposed on the light-transmissive substrate, the semiconductor layers including a p-type layer and an n-type layer, the semiconductor layers defining a device mesa; and

a reflective electrode disposed on the device mesa to energize the device mesa to produce light and to reflect the light produced by the device mesa toward at least one of the light-transmissive substrate and sides of the device mesa, the reflective electrode including:

a light-transmissive insulating material disposed over the device mesa;

an electrical connecting material disposed over the device mesa and making electrical contact with the device mesa, the light-transmissive insulating material and the electrical connecting material being distributed substantially uniformly across the device mesa; and

an electrically conductive reflective film disposed over the light-transmissive insulating material and the electrical connecting material, the electrically conductive reflective film electrically communicating with the electrical connecting material,

wherein one of the light-transmissive insulating material and the electrical connecting material is formed into a grid disposed over the device mesa, and the other of the light-transmissive insulating material and the electrical connecting material is disposed in openings of the grid.

20. (Original) The flip chip light emitting diode die as set forth in claim **19**, wherein the reflective electrode further includes:

a current-spreading layer disposed between the device mesa and the electrical connecting material.

21. (Original) The flip chip light emitting diode die as set forth in claim **20**, wherein the current-spreading layer includes:

a thin conductive film having a thickness less than about 10 nm having greater than 70% light transmission.

22. (Original) The flip chip light emitting diode die as set forth in claim **20**, wherein the current-spreading layer includes:

a short-period superlattice.

23. (Original) The flip chip light emitting diode die as set forth in claim **19**, wherein the plurality of semiconductor layers are selected from a group consisting of group III-nitride semiconductor layers.

24. (Original) The flip chip light emitting diode die as set forth in claim **19**, wherein the grid defines a light-dispersion element that scatters the light produced by the device mesa toward sides of the device mesa.

25. (Original) The flip chip light emitting diode die as set forth in claim **19**, wherein an interface between the light-transmissive insulating material and the electrically conductive reflective film defines a diffraction grating.

26. (Currently Amended) A flip chip light emitting diode die including:

a light-transmissive substrate;

a plurality of semiconductor layers disposed on the light-transmissive substrate, the semiconductor layers including a p-type layer and an n-type layer, the semiconductor layers defining a light emitting device; and

a reflective electrode disposed on a principal surface of the light emitting device to energize the light emitting device to produce light and to reflect the light produced by the light emitting device toward at least one of the light-transmissive substrate and sides of the device, the reflective electrode including:

a light-transmissive ~~surface-passivating~~ insulating material disposed over first lateral area portions of the device mesa, the light-transmissive insulating material being a surface-passivating material;

an electrical connecting material disposed over second lateral area portions of the device mesa, the second lateral area portions being interspersed amongst the first lateral area portions, the electrical connecting material electrically communicating with the light emitting device;

an electrically conductive reflective film disposed over the surface-

passivating material and the electrical connecting material, the electrically conductive reflective film electrically communicating with the electrical connecting material.

27. (Original) The flip chip light emitting diode die as set forth in claim **26**, wherein:

the plurality of semiconductor layers are selected from a group consisting of group III-nitride semiconductor layers; and

the surface-passivating material is selected from a group consisting of a silicon oxide (SiO_x), a silicon nitride (SiN_x), and a silicon oxynitride (SiO_xN_y) where x and y correspond to stoichiometric parameters.

28. (Original) The flip chip light emitting diode die as set forth in claim **26**, wherein:

the plurality of semiconductor layers are selected from a group consisting of group III-nitride semiconductor layers; and

the surface-passivating material is a dielectric material.